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⑤④ **Beer lines cleansing device with coupling member therefor.**

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GB-A- 2 140 121
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US-A- 3 799 182

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Description

The present invention relates to a device for cleansing beverage lines, especially beer lines, each intended to be connected at one end with a coupling member to be inserted into the bung hole of a barrel, the other end leading to a corresponding tap, the coupling member being provided with

- a connection for connecting it with a container of carbon dioxide, in order to place the interior of the barrel under pressure of carbon dioxide;
- a dip tube to be inserted into the barrel, which tube is or is to be connected to the corresponding line; and
- valve means forming an integral unit with the corresponding coupling member, the valve means being adapted to connect the beverage line with the barrel or with a line for rinsing liquid, and being provided with a driving means to control it, so that each line can be cleansed,

It is known to construct beer lines in this way in order to enable them to be rinsed through. This should, in principle, take place at the end of a day in order to prevent beer from remaining in the line for too long.

Furthermore, the beer lines have to be cleansed more thoroughly at regular intervals. This is usually done by professionals, who for that purpose have to disconnect the lines. An additional problem is that this cleansing cannot usually be carried out at the most appropriate time, since one is dependent on the availability of these professionals.

From EP-A-0 269 152 a coupling member is known per se, which forms an integral unit with the three-way valve. The pressure used during the cleansing operation has to be carefully controlled as during this operation the cleansing liquid is in direct contact with the valve of the barrel. If the pressure is too high cleansing liquid may enter the barrel and pollute the remainder of the beverage present therein. Beer especially, is very sensitive to pollution, as it quickly acquires an unpleasant taste and/or loses its head. Also, it often occurs that the valve of a barrel, after it has been broached by a dip tube, leaks if the dip tube is removed before the barrel is empty. The coupling member according to EP-A-0 269 152 also makes use of so-called lip valves which are susceptible to wear, so that there is some danger for instance of beer entering the rinsing liquid line.

The present invention aims to remedy these disadvantages and to that purpose provides a device as characterized in claim 1.

With this device, daily cleansing can be carried out in a simple way without the risk of polluting the beverage and being restricted to relatively low cleansing pressures.

It is possible, according to the invention, to cleanse beer lines thoroughly and hygienically along

substantially their entire length, from the beer barrel to the tap itself; an additional advantage is that the air bubble which is usually present between the coupling member and the tap after the connection of a new barrel is reduced to negligible proportions, so that there is no longer any risk of infection. Besides, the device according to the invention does not require the help of professionals to be called in, nor is it necessary to disconnect the lines or reconnect them with each other.

Further embodiments of the device are claimed in claims 2-13.

In the following the invention will be described in greater detail with reference to the accompanying drawing, showing in:

Fig. 1 a general diagram of the tap installation according to the present invention;

Fig. 2 and 3a-c respective consecutive cleansing steps of a method for cleansing beverage lines using the device according to fig. 1;

Fig. 4 an embodiment of the coupling member according to the present invention; and

Fig. 5 (a) and (b) discs for use in a tap as a three-position slide valve.

In fig. 1, 1a-1d indicate taps with drains 23a-d at four drawing points. These taps are connected by lines passing through a cooling apparatus 2 to barrels 3a, 3b, 3c and 3d, respectively. Just above these barrels coupling members 4a, 4b, 4c and 4d, respectively comprising a three way valve are shown which can be switched over to connect the beverage line 5a, 5b, 5c and 5d respectively, to the barrel 3a, 3b, 3c and 3d, respectively, or a rinsing liquid line 6a, 6b, 6c, 6d, respectively, as the case may be. The reference numeral 7 indicates a cylinder of carbon dioxide gas which is connected to the respective coupling members of the barrels to keep these barrels pressurized and to provide the beverage with carbon dioxide. The specific construction of the coupling member according to the invention will be discussed with reference to fig. 4.

The rinsing liquid lines 6a, 6b, 6c and 6d which branch out from the three-way valves of the coupling members 4a, 4b, 4c and 4d are connected, via a distributor 8, to a valve assembly 9, 10, 11 and 12, the functioning of which will be explained with reference to the following Figs. Adjacent to the valve 12 there is a drain 24.

The reference numerals 13 and 14 indicate sponge catchers and the reference numeral 26 indicates a pump.

The said valve assembly is connected to water mains 15 and a storage vessel (buffer vessel) 16 in which there are a float valve 17 and a jet pump 18. The jet pump 18 is connected, at one end, to the three-way valve 12 and the inlet connection is connected, via a three-way valve, to a storage container 20 for cleansing agent.

A characteristic feature of this device is that adjacent to the drawing points there are provided actuation panels 21a, 21b, 21c, 21d, by means of which a sequential controller 22 may be actuated, the sequential controller in turn actuating all the three-way valves in the system. Also, sensors may be provided in the sponge-catchers to detect the presence of a sponge, in which case these sensors are also connected with the sequential controller 22.

In Fig. 2 and the subsequent Figs., the suffixes a - d have been omitted from the reference numerals, since the parts shown in these Figs. are illustrated for one beverage line only. In Fig. 2, a first operation step for cleansing beverage lines, viz. rinsing with water, is shown. For this purpose, the tap, e.g. 1, is connected via the cooling apparatus 2 to the coupling member 4, the corresponding three-way valve being switched so that the beverage line 5 is connected with the rinsing liquid line 6. This rinsing liquid line 6 passes via the distributor 8, the three-way valves 9 and 11 of the valve system to the water mains 15. By opening the tap 1 at this point, the entire line is rinsed with water.

Prior to this entire operation a user at the respective drawing point has indicated through the actuating panel 21 that it is desired to rinse the line 5. The sequential controller 22 has set the relative valves and the distributor in the way indicated in Fig. 2 in response to the signal thus given.

As a line is rinsed in this way, the beverage therein is pushed away by the rinsing water and so it can be used almost completely. The other lines are rinsed in the same way. During the rinsing or cleansing of one line the other lines can be used normally.

A thorough cleansing is shown in Fig. 3. This cleansing is only carried out after rinsing according to Fig. 2 has taken place. In the course of this cleansing, the sequential controller 22 switches all the valves as shown in Fig. 3a, after the end of a connecting line 25 is connected to the end of the tap 1. To prevent the line being rinsed before the line end in question is fixed to the tap, there may be provided in the tap and/or the end of the cleansing agent return line 25 a sensor which is also connected to the sequential controller 22. The coupling member of the cleansing agent return line 25 is preferably provided with a non-return valve which is lifted during the application thereof to a tap.

By means of the pump 26, water from the vessel 16 is circulated, in the course of which a cleansing agent is supplied into the storage vessel 16 from the cleansing agent storage container 20 through the intermediary of a three-way valve 19. The storage vessel 16 is filled with water during the preceding operation and also during normal use. From the storage vessel 16, water with the cleansing agent moves via the pump 26, the three-way valves 11 and 10 to the sponge catcher 14. The sponge present in this

sponge-catcher 14 is drawn by the current through the cleansing agent return line 25 to the sponge-catcher 13 via the tap 1, the beverage line 5, the coupling member 4, the rinsing liquid line 6 and the distributor 8. A sensor which may be present in the sponge-catcher 13 transmits a signal to the sequential controller 22 after having received the sponge. The cleansing liquid with water moves via the sponge catcher 13 through the three-way valves 9 and 12 and back to the vessel 16. The valve 19 is kept open by the sequential controller 22 until a sufficient quantity of rinsing liquid has been pumped into the vessel 16.

Next, the sequential controller 22 switches the valves in the valve system as shown in Fig. 3b, to reverse the direction of the flow through the beverage line 5. By this reversal of the direction of flow, the sponge caught in the sponge-catcher 13 in Fig. 3a is returned to the sponge-catcher 14 while cleansing the lines it passes. The sensor present in the sponge-catcher 14 transmits a signal to the sequential controller after the sponge has been caught. The operations shown in Fig. 3a and 3b may be repeated several times, provided that the last operation is according to Fig. 3b.

In order to complete the cleansing operation, the beverage line 5 has to be rinsed again. To that end, the valves are set as shown in Fig. 3c by the sequential controller 22. In this setting, the pump 26 conveys water under high pressure from the vessel 16 through the line via the three-way valves 11 and 9, the sponge-catcher 13, the distributor 8, the cleansing line 6, the coupling member 4 and the beverage line 5 through the tap 1, the cleansing agent return line 25, the sponge catcher 14, the three-way valves 10 and 12 to a drain 24. The presence of the storage vessel 16 provides a buffer store of water for this operation, since the speed at which the pump thrusts the water through the lines is too great to be drawn directly from the water mains. By connecting, as shown at 27 in Figs. 1 and 3b, the circulation line from the three-way valve 19 to the jet pump 18 with the rinsing line in the normal position of this valve, the pump will always be freed of cleansing agent.

After this cleansing operation, either the three-way valve of the coupling member 4 is switched over to reconnect the beverage line 5 to the barrel 3, or a new barrel is broached before the three-way valve is switched over.

The use of the device according to the present invention has the important advantage that the beverage line in question can be rinsed from a drawing point while the other drawing points remain in use. In addition, cleansing may be carried out without disconnecting the barrel and the risk of detergent in the beverage to be drawn off after cleansing is reduced to a minimum.

The sequential controller is not strictly necessary

provided that the parts actuated through this controller can be actuated in a corresponding manner. Neither are the sensors essential.

The entire invention can also be considerably simplified by not moving the cleansing liquid through the lines in two directions, but in one direction only, while pulsating the liquid flow. This pulsating is preferably carried out with a turbulent flow of the liquid. This means that the valve assembly 9 and 10 can be left out and operation without sponges is also possible, so that the sponge catchers 13, 14 can be left out.

In Fig. 4 an embodiment of the coupling member 4 according to the invention is shown with a dip tube 29, which is inside a guide sleeve 30 provided with a carbon dioxide supply 31. This sleeve 30 is inserted into a fitting 32. At the lower end of the coupling member 4, a collar 30' is provided, which is inserted into the bung hole 33 of a barrel 3. Between the members 30 and 30' a slide 34 with a through aperture 35 and a trough-shaped recess 36 is provided. The through aperture 35 allows the dip tube 29 to pass through when the barrel is broached. The movement 29' of the dip tube 29 can be carried out by hand or by, e.g., hydraulic means. The trough-shaped recess 36 connects the dip tube with the rinsing liquid line 6 in the position of the slide shown in Fig. 4. The slide 34 is connected with a drive rod 38 and lodged in a housing 37. The slide 34 may be moved in a variety of ways, e.g. by connecting an electric motor or a hydraulic piston with the rod 38. It is necessary, however, that before the slide 34 is moved, the dip tube is withdrawn to a position above the slide 34. This may be ensured in a simple manner, e.g. by mechanical or electronic latching means such as sensors and the like which may be connected to e.g. the sequential controller. The slide 34 is usually made of a ceramic material, it being advantageous to have the slide 34 slidable along ceramic sealing surfaces 41 and 42.

The reference numeral 40 indicates a springpack-
et which ensures a smooth movement of the slide 34.

The coupling member 4 shown in Fig. 4 is suitable for use both in the device according to the present invention in case of the use of reciprocating sponges and in case of the use of a unidirectional pulsating of cleansing liquid.

The advantage of the coupling member according to fig. 4 is that the complete dip tube 29, including its forward end, can be cleansed, and that the three-way valve is included in it, and so substantially no dead space is present therein. Moreover, the inclusion of the three-way valve has the advantage of reducing the overall dimensions accordingly, and mounting the assembly onto a barrel is extremely easy since the connections with the various lines need not be disconnected and the dip tube 29 can be moved through the slide 34 which acts as the three-way valve. Finally the pressure used during cleansing is not critical and pollution of the beverage is completely

prevented.

It will be obvious that all drive members and sensors, if present, of the coupling member may be connected to the sequential controller 22.

Fig. 5(a) and 5(b) show top views of discs 43 and 44, which will usually be made of a ceramic material, of a three-position slide valve for a tap 1 which can be used in the device according to the present invention. Fig. 5(a) shows the fixed disc 43 with a beverage line inlet aperture 45, an air vent 46, and a cleansing agent return line aperture 47. Fig. 5(b) shows the rotary disc 44 which lies under the disc 43 in the tap 1. This latter disc comprises a beverage outlet 48 and a U-shaped recess 49. This recess can also be replaced by a U-shaped tube. In the position of the discs shown in this Fig., i.e. with the arrows A and B coinciding, the beverage line 5 is connected to the beverage outlet 48. By rotating the disc 44 so that the arrow C will coincide with the arrow A, the beverage line inlet aperture 45 is closed off and the beverage outlet opening 48 is connected with the air vent 46, allowing beverage remnants in the tap 1 to run out. In addition, the beverage line 5 can be connected with the cleansing agent return line 25 by rotating the disc 44 so that the arrows A and D will coincide. Preferably, an unlatching mechanism is actuated to enable the tap 1 to be rotated in this latter position in order to prevent the inadvertent influx of beverage into the cleansing agent return line.

Claims

1. A device for cleansing beverage lines, especially beer lines, each intended to be connected at one end with a coupling member to be inserted into the bung hole of a barrel, the other end leading to a corresponding tap, the coupling member being provided with
 - a connection for connecting it with a container of carbon dioxide, in order to place the interior of the barrel under pressure of carbon dioxide;
 - a dip tube to be inserted into the barrel, which tube is or is to be connected to the corresponding line; and
 - valve means forming an integral unit with the corresponding coupling member, the valve means being adapted to connect the beverage line with the barrel or with a line for rinsing liquid, and being provided with a driving means to control it, so that each line can be cleansed,
- characterized in that the valve means are constructed as a three-way valve with two operating positions, in one position connecting the beverage line (5a-5d) with the barrel, and in the other position, while closing off the passage to the bar-

rel unambiguously, connecting the beverage line (5a-5d) to the rinsing liquid line (6).

2. Device according to claim 1, **characterized in that** the three-way valve is located at the upper side of the coupling member (4), being capable of connecting the beverage line (5a-5d) with the dip tube (29) in the first position and connecting the beverage line (5a-5d) with the rinsing liquid line (6) in the second position, while closing of the connection to the dip tube (29).

3. Device according to claim 1, **characterized in that** the three-way valve of the coupling member (4) is located at the lower side of the coupling member (4) and comprises a slide (34) directed transversely to the longitudinal axis of the dip tube (29) with two positions, said slide (34) in one position allowing the dip tube (29) to be shifted, and in the other position, in which the dip tube (29) is withdrawn, while closing off the passage to the barrel (3a-3d), forming a connection between the rinsing liquid line (6) and the beverage line (5a-5d) along the head portion of the dip tube (29).

4. The device according to claim 3, **characterized in that** the slide (34) is a flat through slide with a small height.

5. The device according to claims 3 and 4, **characterized in that** the slide (34) comprises discs (34, 41, 42) clamped together and made of stainless steel and/or ceramic material.

6. The device according to one or more of claims 1-5, connected or connectible to a circulation system adapted to circulate by means of a circulation pump a cleansing liquid and cleansing bodies from a storage container through one or more beer lines and returning this liquid to the storage container and provided with members for retaining these bodies upon their leaving a connected line, **characterized in that** the rinsing liquid line (6a-6d) of the or each three-way valve is connected with a flow distributor (8) which is adapted to connect one three-way valve respectively to one connection of the circulation system, the other connection of this system being connected to a return line, the other end of which is connectible to the discharge of the relative tap (1a-1d), the connections of this system each being provided with a remotely actuatable assembly of reversing valves which is adapted to circulate the flow of cleansing agent alternately in either direction, the retaining members (13, 14) being included in the connection and between the distributor (8) and the reversing assembly, this in such a

way that each line (5a-5d) can be cleansed separately.

7. The device according to claim 6, **characterized in that** the rinsing liquid line (6a-6d) is connected through the intermediary of a valve with the reversing assembly in such a way that, in the position of this assembly in which the cleansing liquid is led to a tap (1a-1d), upon opening of this valve the supply of cleansing liquid is connected with the distributor (8) while the connection with the storage container (16) is interrupted.

8. The device according to claim 7, **characterized in that** in the return connection between the reversing assembly and the storage container (16) there is incorporated a remotely actuatable three-way valve (12) by means of which this connection can be connected with the storage container (16) or a rinsing liquid outlet (24) as desired.

9. The device according to any one of claims 6-8, **characterized in that** the storage container (16) is connected by means of a remotely actuatable valve (19) to a cleansing agent container (20), said valve (19) being adapted to admit a certain quantity of cleansing agent to the liquid

10. The device according to claim 9, **characterized in that** the valve (19) for the cleansing agent is connected with the suction side of a jet pump (18) which is included in the circulation line.

11. The device according to claim 10, **characterized in that** the valve (19) is a three-way valve, which in the normal position connects the suction side of the pump with the circulation line.

12. The device according to any one of claims 6-8, **characterized in that** the connection of the return line (25) for cleansing agent on a tap (1a-1d) and every tap is provided with sensors which are connected to the driving means of the distributor (8) so that the circulation system can operate only when this connection is set to the tap (1a-1d) corresponding to the position of the distributor (8).

13. The device according to any one of claims 6-12, **characterized in that** the retaining members (13, 14) for the cleansing bodies are provided with sensors which are connected to the driving means for the reversing assembly so that this can only be switched over after these bodies have arrived in the retaining member (13, 14) in question for switching over.

14. The device according to any one of claims 1-13, **characterized in that the remotely actuatable valve- and/or switch devices, sensors etc. are connected to a sequential controller (22).**

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15. A device for cleansing beverage lines according to one or more of claims 1 to 14, **characterized in that the coupling member (4) comprises a slide (34) directed transversely to the longitudinal axis of the dip tube (29) with two positions, said slide in one position allowing the tube to be shifted, and forming in the other position, in which the dip tube (29) is withdrawn, while closing off the passage to barrel (3a-3d), a connection between the rinsing liquid line (6) and the beverage line (5a-5d) along the head portion of the dip tube (29).**

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Patentansprüche

1. Vorrichtung zum Reinigen von Getränkeleitungen, insbesondere von Bierleitungen, die jeweils an einem Ende mit einer in das Zapfloch eines Fasses einzuführenden Kupplungsvorrichtung zu verbinden sind, und deren anderes Ende zu einem korrespondierenden Hahn führt, und in der die Kupplungsvorrichtung versehen ist mit

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- einem Anschluß für die Verbindung der Vorrichtung mit einem Kohlendioxidbehälter, der dazu dient, das Innere des Fasses unter Kohlendioxiddruck zu setzen;
- einem in das Faß einzuführenden Tauchrohr, das mit der korrespondierenden Leitung verbunden ist oder wird, und
- Ventilvorrichtungen, die einen integralen Bestandteil der korrespondierenden Kupplungsvorrichtung bilden, wobei die Ventilvorrichtungen so ausgebildet sind, daß sie die Getränkeleitung mit dem Faß oder mit einer Spülflüssigkeitsleitung verbinden, und wobei die Ventilvorrichtungen mit einer Antriebsvorrichtung für deren Steuerung versehen ist, so daß jede Leitung gereinigt werden kann,

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dadurch gekennzeichnet, daß die Ventilvorrichtungen als Dreiwegeventil mit zwei Betriebsstellungen ausgebildet sind, wobei dieses Ventil in der einen Stellung die Getränkeleitung (5a-5d) mit dem Faß verbindet und in der anderen Stellung, unter eindeutigen Verschluss der Durchgangs zum Faß, die Getränkeleitung (5a-5d) mit der Spülflüssigkeitsleitung (6) verbindet.

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2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß das Dreiwegeventil an der Oberseite der Kupplungsvorrichtung (4) positioniert ist und in der Lage ist, in der ersten Position die Ge-**

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tränkeleitung (5a-5d) mit dem Tauchrohr (29) zu verbinden und in der zweiten Position, unter Verschluss der Verbindung zum Tauchrohr (29), die Getränkeleitung (5a-5d) mit der Spülflüssigkeitsleitung (6) zu verbinden.

3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß das Dreiwegeventil der Kupplungsvorrichtung (4) an der Unterseite der Kupplungsvorrichtung (4) positioniert ist und einen quer zur Längsachse des Tauchrohres (29) gerichteten Schlitten (34) mit zwei Stellungen umfaßt, wobei dieser Schlitten (34) in einer Position das Verschieben des Tauchrohres (29) ermöglicht und in der anderen Position, in der das Tauchrohr (29) zurückgezogen ist, unter Verschluss des Durchgangs zum Faß (3a-3d), eine Verbindung zwischen der Spülflüssigkeitsleitung (6) und der Getränkeleitung (5a-5d) entlang des Kopfendes des Tauchrohres (29) bildet.**

4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, daß der Schlitten (34) ein durchgehender Flachschieber mit geringer Höhe ist.**

5. Vorrichtung nach den Ansprüchen 3 und 4, **dadurch gekennzeichnet, daß der Schlitten (34) miteinander verklemmte Scheiben (34, 41, 42), die aus rostfreiem Stahl und/oder Keramikmaterial bestehen, umfaßt.**

6. Vorrichtung nach einem oder mehreren der Ansprüche 1-5, die mit einem Kreislaufsystem verbunden ist oder verbunden werden kann, das geeignet ist, um mittels einer Umlaufpumpe eine Reinigungsflüssigkeit und Reinigungskörper von einem Vorratsbehälter durch eine oder mehrere Bierleitungen umlaufen zu lassen und diese Flüssigkeit zum Vorratsbehälter zurückzuführen, und die mit Vorrichtungen zum Auffangen dieser Körper, wenn diese eine angeschlossene Leitung verlassen, versehen ist, **dadurch gekennzeichnet, daß die Spülflüssigkeitsleitung (6a-6d) des oder jedes der Dreiwegeventile mit dem Stömungsverteiler (8) verbunden ist, der so ausgebildet ist, daß er jeweils ein Dreiwegeventil mit einem Anschluß des Kreislaufsystems verbindet, wobei der andere Anschluß dieses Systems mit der Rücklaufleitung verbunden ist, deren anderes Ende mit dem Auslaß des jeweiligen Hahns (1a-1d) verbunden werden kann, und die Anschlüsse dieses Systems jeweils mit einem fernsteuerbaren Aggregat von Umschaltventilen versehen sind, das so ausgebildet ist, daß es den Reinigungsmittelfluß abwechselnd in beide Richtungen umlaufen lassen kann, wobei die Auffangvorrichtungen (13,14) in der Verbindung und zwischen dem Verteiler (8) und dem Umschaltaggre-**

gat vorgesehen sind, und zwar so, daß jede Leitung separat gereinigt werden kann.

7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet**, daß die Spülflüssigkeitsleitung (6a-6d) mittels eines Ventils mit dem Umschaltaggregat verbunden ist, so, daß in der Stellung des Aggregats, in der die Spülflüssigkeit zu einem Hahn (1a-1d) geleitet wird, die Spülflüssigkeitszufuhr bei Öffnung dieses Ventils mit dem Verteiler (8) verbunden ist und die Verbindung (16) zum Vorratsbehälter unterbrochen ist. 5
8. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet**, daß in dem Rücklaufanschluß zwischen dem Umschaltaggregat und dem Vorratsbehälter (16) ein fernsteuerbares Dreiwegeventil (12) eingebaut ist, mit dessen Hilfe dieser Anschluß wie jeweils gewünscht mit dem Vorratsbehälter (16) oder einem Spülflüssigkeitsauslaß (24) verbunden werden kann. 10
9. Vorrichtung nach einem der Ansprüche 6-8, **dadurch gekennzeichnet**, daß der Vorratsbehälter (16) durch ein fernsteuerbares Ventil (19) mit dem Spülflüssigkeitsbehälter (20) verbunden ist, wobei dieses Ventil (19) so ausgebildet ist, daß es eine bestimmte Menge von Reinigungsmittel der Flüssigkeit beimischen kann. 15
10. Vorrichtung nach Anspruch 9, **dadurch gekennzeichnet**, daß das Ventil (19) für das Reinigungsmittel mit der Saugseite einer in der Umlaufleitung angebrachten Strahlpumpe (18) verbunden ist. 20
11. Vorrichtung nach Anspruch 10, **dadurch gekennzeichnet**, daß das Ventil (19) ein Dreiwegeventil ist, das in normaler Stellung die Saugseite der Pumpe mit der Umlaufleitung verbindet. 25
12. Vorrichtung nach einem der Ansprüche 6-8, **dadurch gekennzeichnet**, daß der Anschluß der Rücklaufleitung (25) für Reinigungsmittel an einem Hahn (1a-1d) und jeder Hahn mit Sensoren versehen ist, die mit der Antriebsvorrichtung des Verteilers (8) verbunden sind, so daß das Kreislaufsystem nur dann betrieben werden kann, wenn dieser Anschluß auf den Hahn (1a-1d) eingestellt ist entsprechend der Stellung des Verteilers (8). 30
13. Vorrichtung nach einem der Ansprüche 6-12, **dadurch gekennzeichnet**, daß die Auffangbehälter (13, 14) für die Reinigungskörper mit Sensoren versehen sind, die mit der Antriebsvorrichtung des Umschaltaggregats verbunden sind, so daß dieses nur dann umgeschaltet werden kann, 35

wenn die Körper in den für das Umschalten in Frage kommenden Auffangbehältern (13, 14) angekommen sind.

14. Vorrichtung nach einem der Ansprüche 1-13, **dadurch gekennzeichnet**, daß die fernsteuerbaren Ventil- und/oder Schaltvorrichtungen, Sensoren etc. mit einer Folgesteuervorrichtung (22) verbunden sind. 40
15. Vorrichtung zum Reinigen von Getränkeleitungen nach einem oder mehreren der Ansprüche 1 bis 14, **dadurch gekennzeichnet**, daß die Kupplungsvorrichtung (4) einen quer zur Längsachse des Tauchrohres (29) gerichteten Schlitten (34) mit zwei Stellungen unfäßt und dieser Schlitten in einer Stellung das Verschieben des Tauchrohres erlaubt und in der anderen Stellung, in der das Tauchrohr (29) zurückgezogen ist, unter Verschuß des Durchgangs zum Faß (3a-3d) eine Verbindung zwischen der Spülflüssigkeitsleitung (6) und der Getränkeleitung (5a-5d) entlang des Kopfteils des Tauchrohres (29) bildet. 45

Revendications

1. Dispositif de nettoyage de conduites de boisson, en particulier des conduites de bière, prévues chacune pour être raccordées à une extrémité avec un élément de couplage à insérer dans la bonde d'un fût, l'autre extrémité conduisant à un robinet correspondant, l'élément de couplage comportant : 50
 - une connexion pour le raccorder à un récipient de gaz carbonique, afin de placer l'intérieur du fût sous une pression de gaz carbonique ;
 - un tube plongeur à insérer dans le fût, ce tube étant ou devant être connecté à la conduite correspondante ; et
 - une vanne constituant un ensemble unitaire avec l'élément de couplage correspondant, la vanne étant prévue pour connecter la conduite de boisson au fût ou à une conduite de liquide de rinçage, et étant pourvue de moyens d'entraînement pour sa commande, de sorte qu'on peut nettoyer chaque conduite, 55
- caractérisé en ce que la vanne est construite sous la forme d'une vanne à trois voies à deux positions de fonctionnement de sorte que, dans une première position, elle relie la conduite de boisson (5a-5d) au fût et, dans l'autre position, tout en fermant de façon sûre le passage vers le fût, elle connecte la conduite de boisson (5a-5d) à la conduite de liquide de rinçage (6).

2. Dispositif suivant la revendication 1, caractérisé en ce que la vanne à trois voies est placée du côté supérieur de l'élément de couplage (4), elle peut connecter la conduite de boisson (5a-5d) au tube plongeur (29) dans la première position et connecter la conduite de boisson (5a-5d) à la conduite de liquide de rinçage (6) dans la deuxième position, tout en fermant la communication avec le tube plongeur (29). 5
3. Dispositif suivant la revendication 1, caractérisé en ce que la vanne à trois voies de l'élément de couplage (4) est placée du côté inférieur de l'élément de couplage (4) et comprend un obturateur glissant (34) dirigé transversalement à l'axe longitudinal du tube plongeur (29) et ayant deux positions, ledit obturateur glissant (34) permettant dans une première position de déplacer le tube plongeur (29) et, dans l'autre position, dans laquelle le tube plongeur (29) est retiré, tout en obturant le passage vers le fût (3a-3d), créant une communication entre la conduite de liquide de rinçage (6) et la conduite de boisson (5a-5d) le long de la tête du tube plongeur (29). 10
4. Dispositif suivant la revendication 3, caractérisé en ce que l'obturateur glissant (34) est un obturateur traversant plat de faible hauteur. 15
5. Dispositif suivant les revendications 3 et 4, caractérisé en ce que l'obturateur (34) comprend des disques (34,41,42) bloqués ensemble et fabriqués en acier inoxydable et/ou en céramique. 20
6. Dispositif suivant une ou plusieurs des revendications 1 à 5, connecté ou connectable à un système de circulation prévu pour faire circuler, au moyen d'une pompe de circulation, un liquide de nettoyage et des corps de nettoyage à partir d'un récipient de stockage, dans une ou plusieurs conduites de bière, avec retour de ce liquide au récipient de stockage, et comportant des éléments de retenue de ces corps lorsqu'ils quittent une conduite connectée, caractérisé en ce que la conduite de liquide de rinçage (6a-6d) de la vanne à trois voies, ou de chacune de ces vannes, est connectée à un distributeur de fluide (8) qui permet de connecter une vanne à trois voies respectivement à une connexion du système de circulation, l'autre connexion de ce système étant connectée à une conduite de retour dont l'autre extrémité est raccordable à la sortie du robinet relatif (1a-1d), les connexions de ce système comportant chacune un ensemble actionnable à distance de vannes d'inversion qui permet de faire circuler l'agent de nettoyage alternativement dans un sens ou dans l'autre, les éléments de retenue (13,14) étant inclus dans la connexion et 25
- entre le distributeur (8) et l'ensemble d'inversion, cela d'une manière telle que chaque conduite (5a-5d) peut être nettoyée séparément.
7. Dispositif suivant la revendication 6, caractérisé en ce que la conduite de liquide de rinçage (6a-6d) est connectée par l'intermédiaire d'une vanne à l'ensemble d'inversion d'une manière telle que, dans la position de cet ensemble dans laquelle le liquide de nettoyage est amené à un robinet de puisage (1a-1d), lorsqu'on ouvre cette vanne, la source de liquide de nettoyage est connectée au distributeur (8) tandis que la communication avec le récipient de stockage (16) est interrompue. 30
8. Dispositif suivant la revendication 7, caractérisé en ce que, dans la liaison de retour entre l'ensemble d'inversion et le récipient de stockage (16), est incorporée une vanne à trois voies actionnable à distance (12) au moyen de laquelle cette liaison peut être raccordée au récipient de stockage (16) ou à une sortie de liquide de rinçage (24) comme désiré. 35
9. Dispositif suivant une quelconque des revendications 6 à 8, caractérisé en ce que le récipient de stockage (16) est connecté par l'intermédiaire d'une vanne actionnable à distance (19) à un récipient d'agent de nettoyage (20), ladite vanne (19) étant conçue pour mélanger une certaine quantité d'agent de nettoyage au liquide. 40
10. Dispositif suivant la revendication 9, caractérisé en ce que la vanne (19) pour l'agent de nettoyage est connectée avec le côté aspiration d'une pompe à éjecteur (18) qui est incorporée dans la conduite de circulation. 45
11. Dispositif suivant la revendication 10, caractérisé en ce que la vanne (19) est une vanne à trois voies qui connecte, dans la position normale, le côté aspiration de la pompe à la conduite de circulation. 50
12. Dispositif suivant l'une quelconque des revendications 6 à 8, caractérisé en ce que la connexion de la conduite de retour (25) de l'agent de nettoyage sur un robinet (1a-1d) à chaque robinet comporte des capteurs qui sont reliés aux moyens d'entraînement du distributeur (8) de sorte que le système de circulation peut fonctionner seulement lorsque cette connexion est établie vers le robinet (1a-1d) correspondant à la position du distributeur (8). 55
13. Dispositif suivant l'une quelconque des revendications 6 à 12, caractérisé en ce que les éléments

de retenue (13,14) pour les corps de nettoyage comportent des capteurs qui sont reliés aux moyens d'entraînement de l'ensemble d'inversion de sorte que celui-ci peut seulement être commuté après l'arrivée de ces corps dans l'élément de retenue (13,14) concerné pour la commutation.

14. Dispositif suivant l'une quelconque des revendications 1 à 13, caractérisé en ce que la vanne actionnable à distance et/ou les dispositifs de commutation, les capteurs, etc., sont connectés à une unité de commande séquentielle (22).

15. Dispositif de nettoyage de conduites de boisson suivant une ou plusieurs des revendications 1 à 14, caractérisé en ce que l'élément de couplage (4) comprend un obturateur glissant (34) dirigé transversalement à l'axe longitudinal du tube plongeur (29) et ayant deux positions, ledit obturateur dans une première position permettant de déplacer le tube et engendrant dans l'autre position, dans laquelle le tube plongeur (29) est retiré, tout en obturant le passage vers le fût (3a-3d), une communication entre la conduite de liquide de rinçage (6) et la conduite de boisson (5a-5d) le long de la tête du tube plongeur (29).

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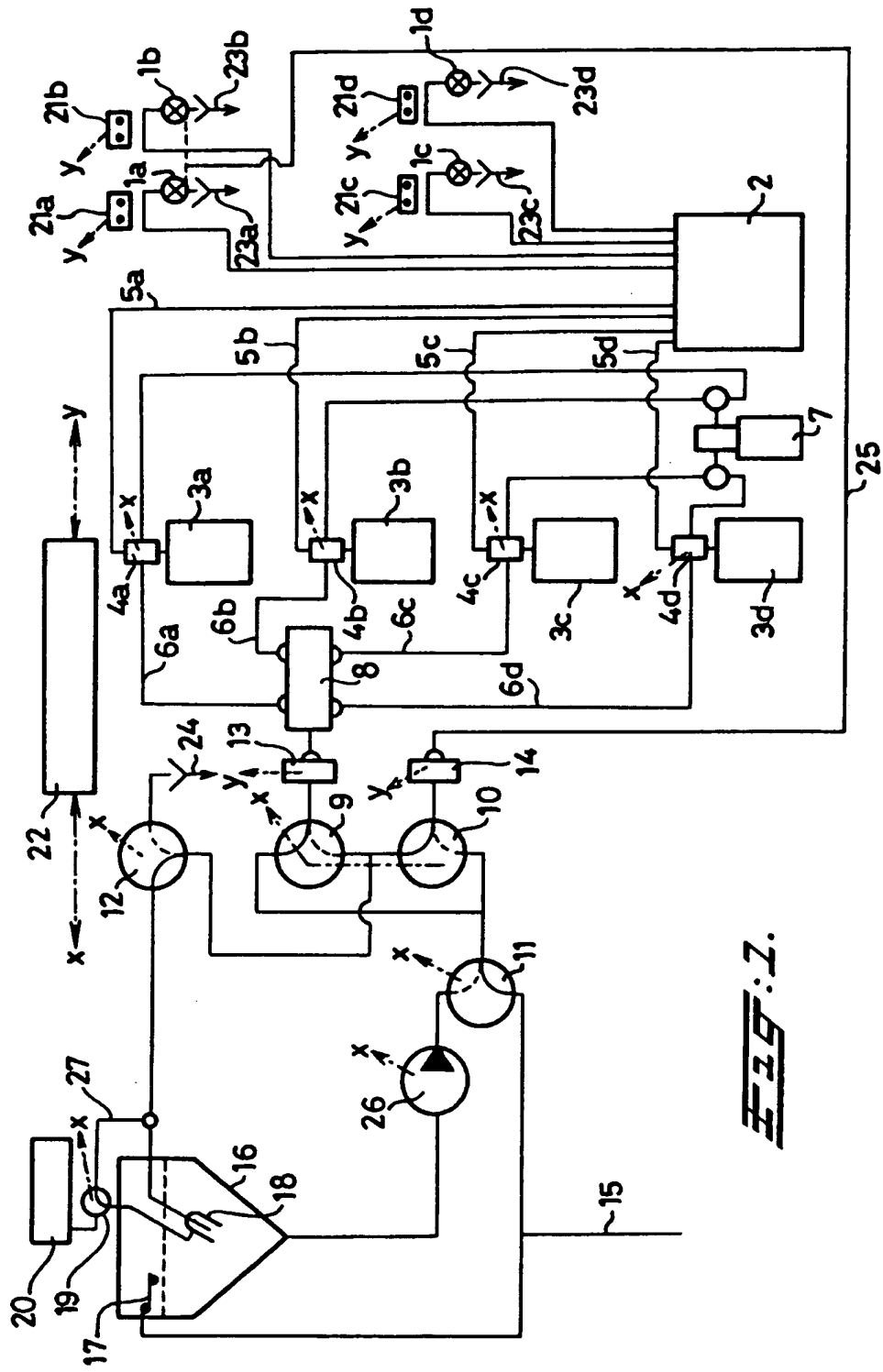


Fig. 1.

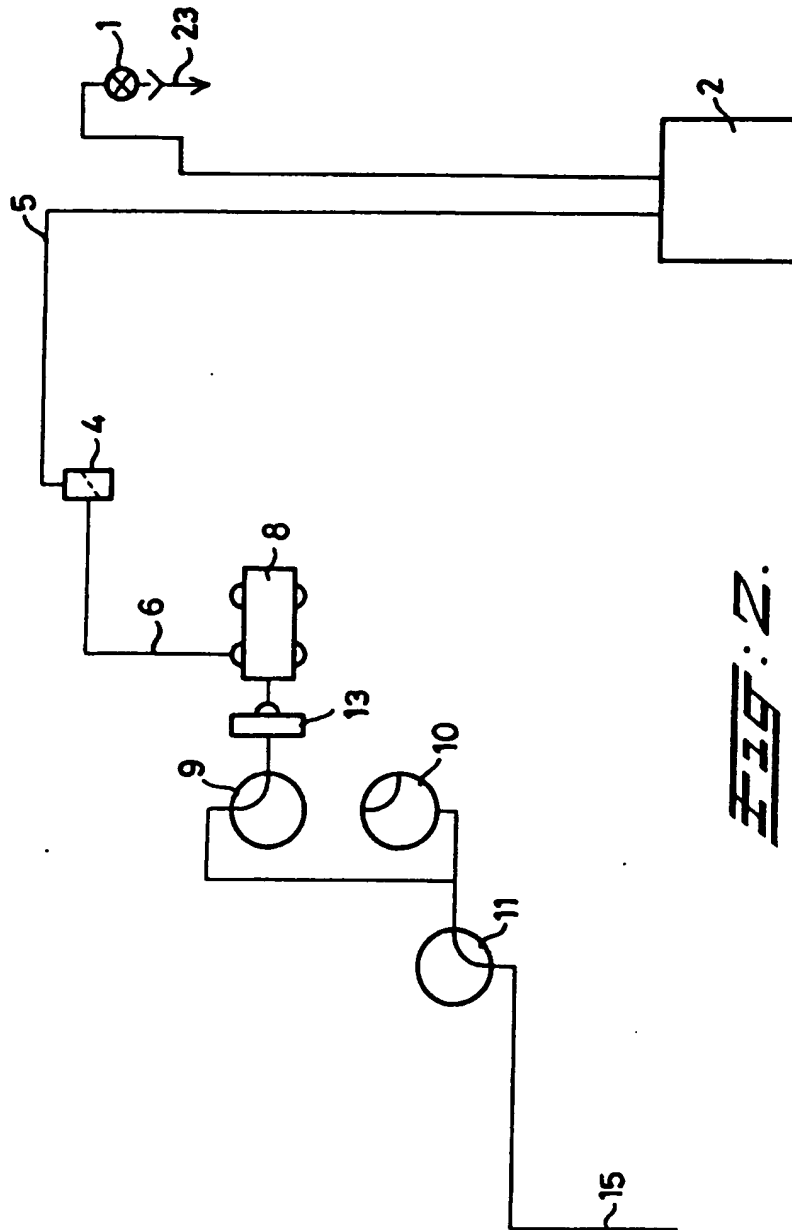
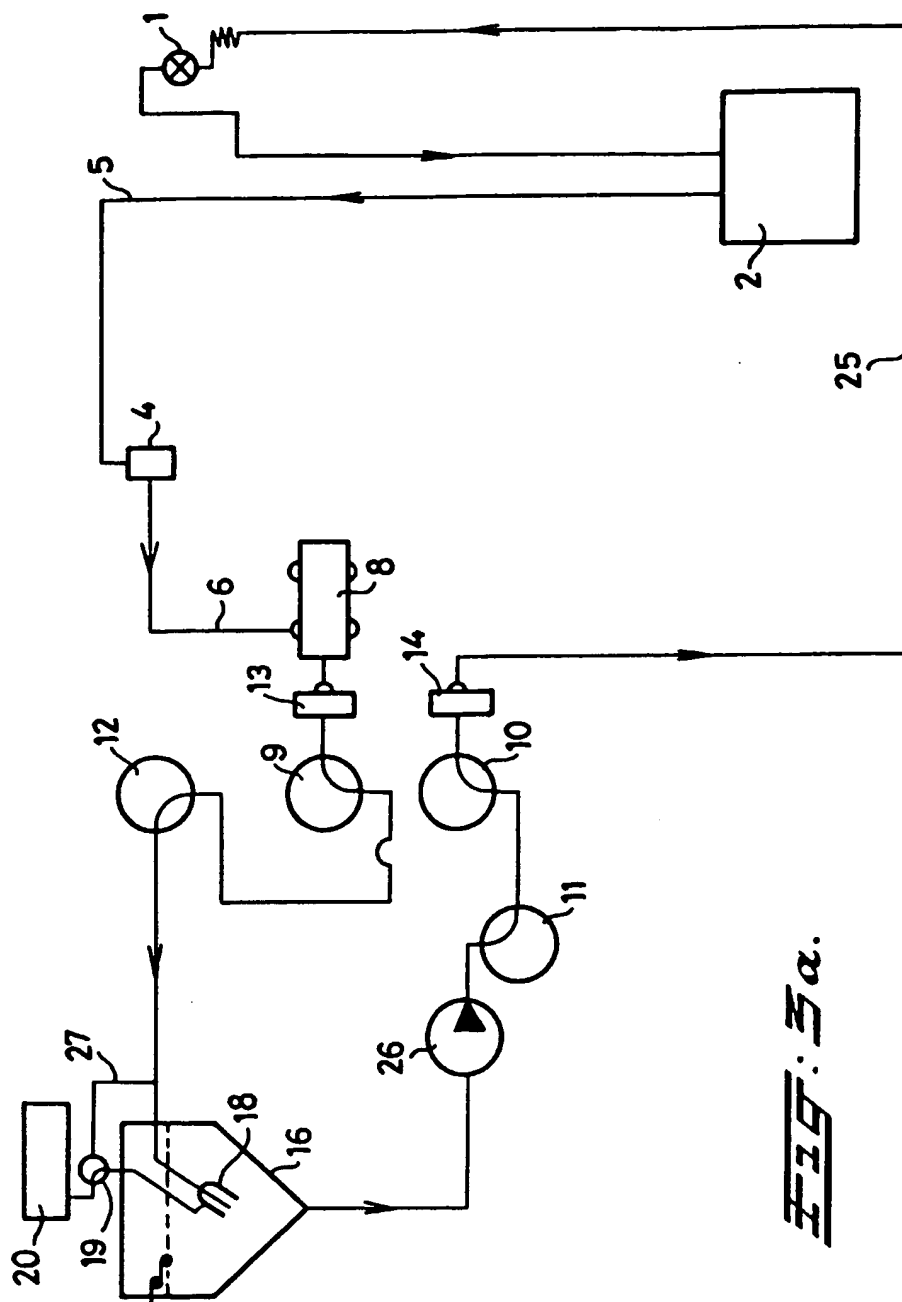


Fig. 2.

Fig. 3a.

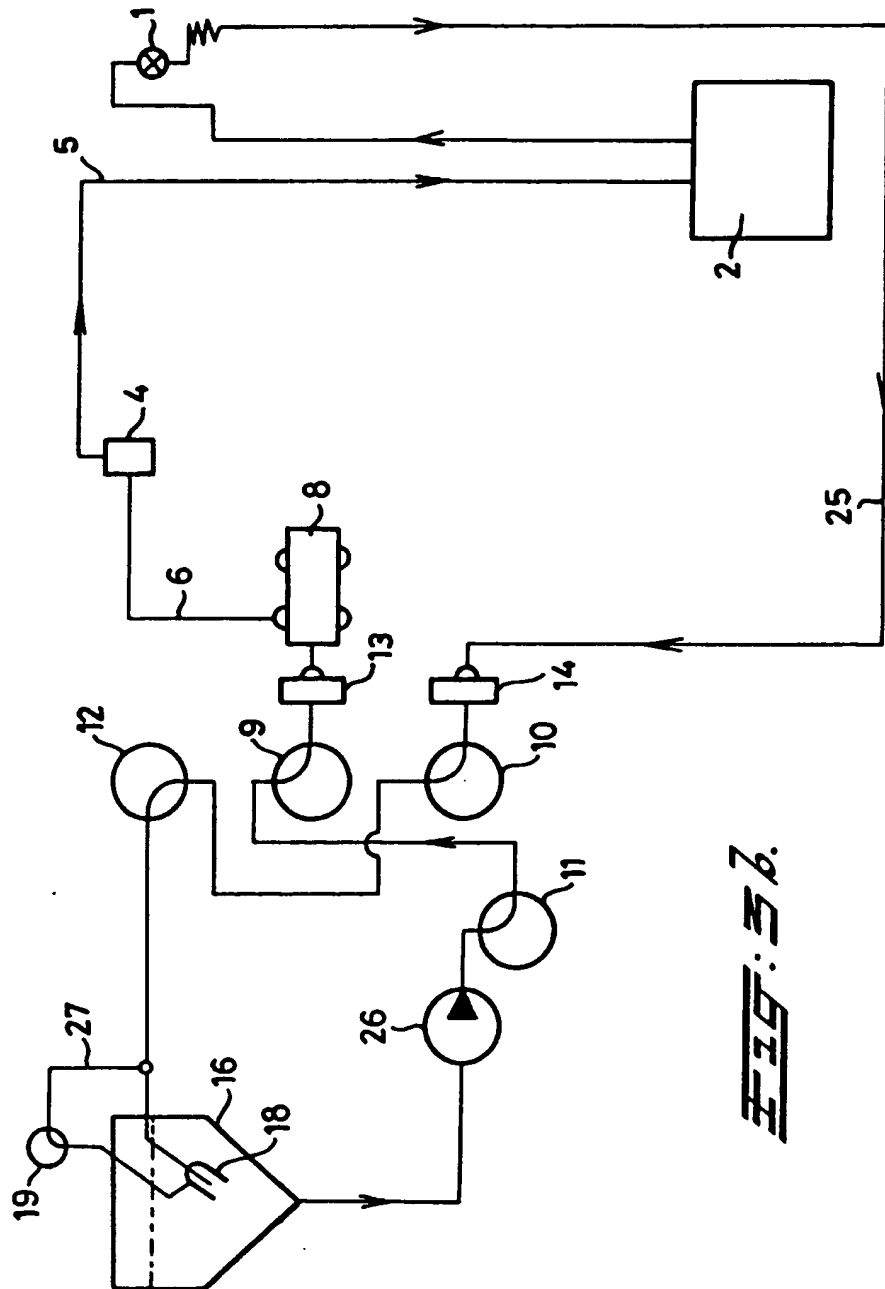


Fig. 5b.

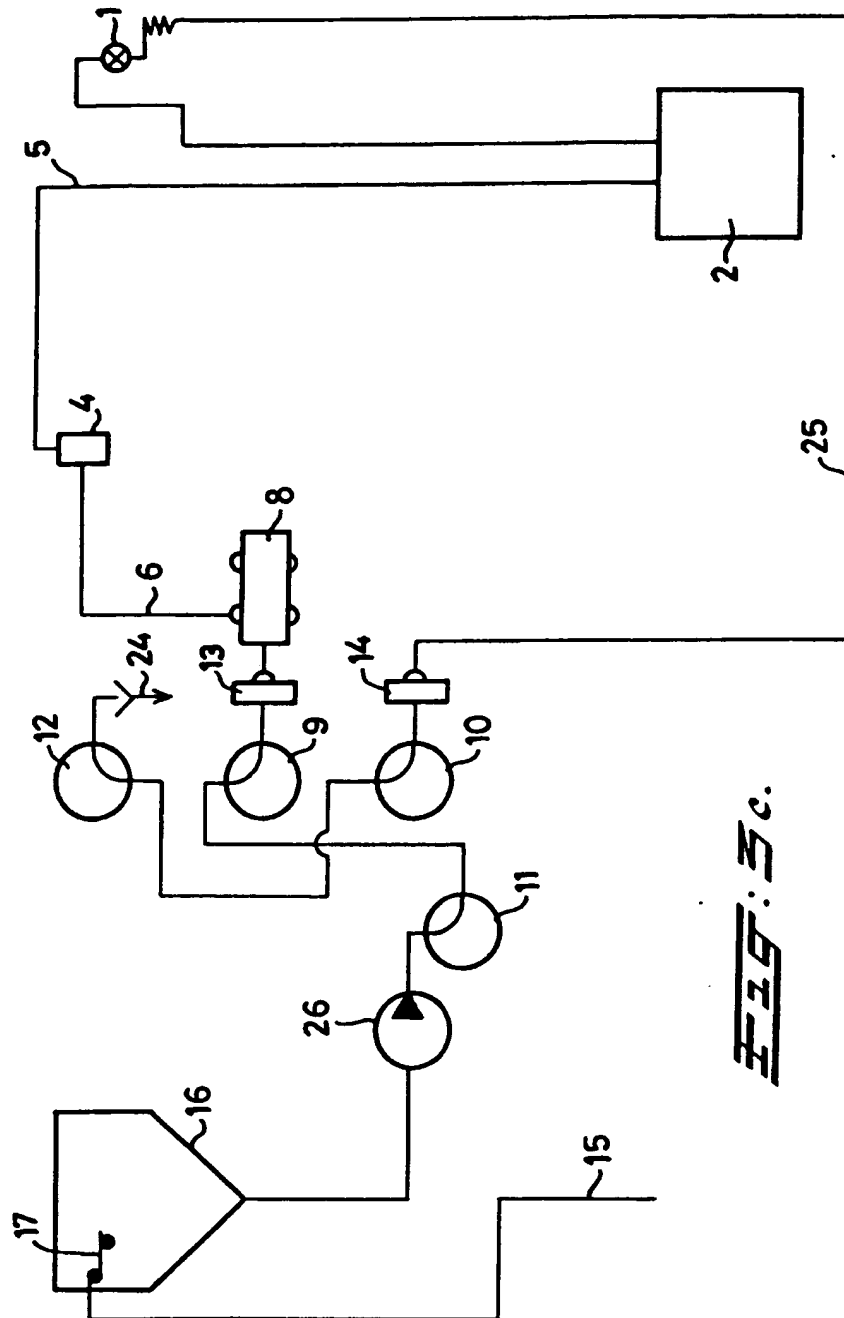


Fig. 3c.

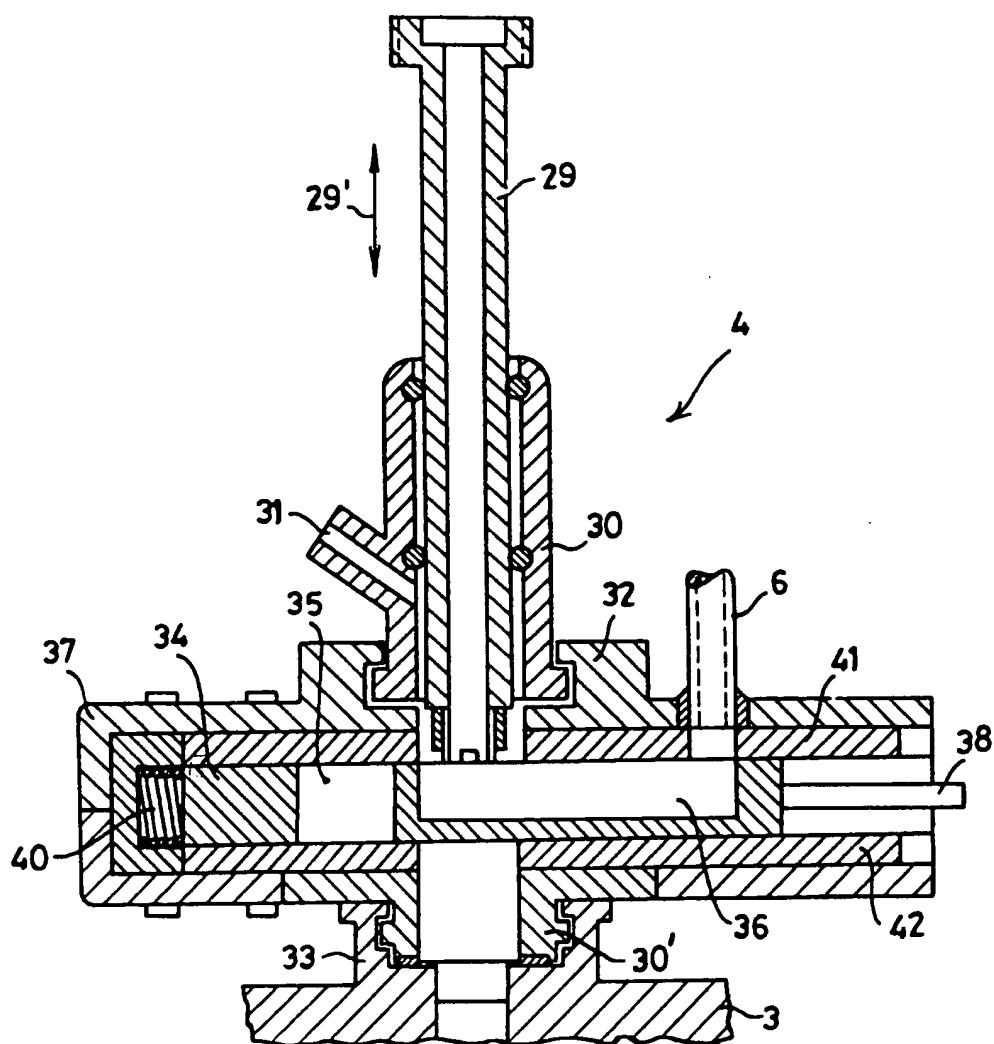


FIG. 4.

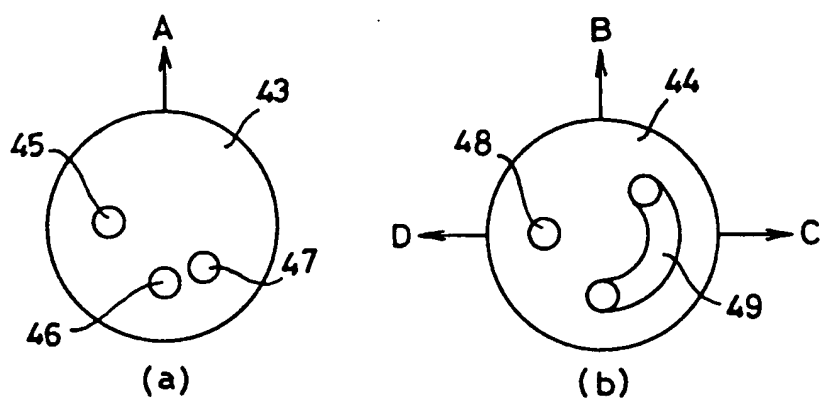


FIG. 5.